CLAIMS

1. A placement guide used for coupling of an optical probe of an optically based noninvasive glucose analyzer to a sampling site in a sampling skin, said optical probe comprising at least one optical incident member for delivering incident photons into said sampling site and an optical collection member for collecting photons emerging from said sampling site, said guide comprising:

a mount having a contact surface at one end, at least a portion of said contact surface being in contact with said sampling skin;

an aperture, defined by said mount, which is adapted to receive said optical probe, wherein an area defined by said aperture comprises said sampling site; and

a hydration inducing plug attached, from said aperture, to said mount at said one end, wherein an outer surface of said hydration inducing plug is aligned with said contact surface of said mount, said outer surface being in direct contact with said sampling site;

wherein said hydration inducing plug acts an optical interface between said optical probe and said sampling site when said optical probe is coupled into said aperture.

2. The guide of Claim 1, wherein said hydration inducing plug has any of the following characteristics:

hydrophobic;

insulating;

mechanically flexible and strong;

near-IR transmissive from 1100 to 1900 nm; and

index of refraction matched.

3. The guide of Claim 1, wherein said hydration inducing plug is made of fluoropolymer.

4. The guide of Claim 1, wherein said hydration inducing plug is an evenly flat member.

5. The guide of Claim 1, wherein said hydration inducing plug comprises multiple layers.

6. The guide of Claim 5, wherein each of said layers has its own physical properties.

7. The guide of Claim 5, wherein said multiple layers are unevenly heat compressed.

8. The guide of Claim 7, wherein a central area of said hydration inducing plug is heat compressed to be thinner than the surrounding area.

9. The guide of Claim 1, wherein said hydration inducing plug has an aperture formed in its center thereof, wherein upon said optical probe being coupled with said guide, said optical collection member of said optical probe is coupled into said aperture and has direct contact with said sampling site, while said optical incident member of said optical probe maintains direct contact with a surrounding area of said hydration inducing plug.

10. The guide of Claim 1, wherein an inner surface of said hydration inducing plug is shaped as an optical convexity, and wherein an aperture is formed in a center of said hydration inducing plug, wherein upon said optical probe being coupled with said guide, said optical collection member of said optical probe is coupled into said aperture and has direct contact with said sampling site.

11. The guide of Claim 1, wherein said optical collection member of said optical probe is coupled into said aperture and has direct contact with said sampling site, and wherein a small space is maintained between said hydration inducing plug and said optical incident member of said optical probe.

12. The guide of Claim 1, wherein said mount comprises at least one reservoir for containment of an optical coupling fluid, said at least one reservoir being connected to one or more channels via which said optical coupling fluid is lead to said sampling site, said optical coupling fluid spreading between the outer surface of said hydration inducing plug and the skin surface of said sampling site.

13. The guide of Claim 12, wherein said optical coupling fluid is near-IR inactive.

14. The guide of Claim 12, wherein said optical coupling fluid comprises any of:

a chlorofluorocarbon; and

a chlorofluorocarbon polymer.

15. The guide of Claim 12, wherein said optical coupling fluid comprises any of:

a fluorocarbon molecule;

a fluorocarbon polymer;

a fluorocompound; and

a mixture or solution of any of the above.

16. The guide of Claim 12, wherein said optical coupling fluid is delivered in any of a manual and an automated fashion to said sampling site.

17. The guide of Claim 12, wherein said optical coupling fluid is directed to said sampling site by at least one of:

gravity;

diffusion;

a guiding channel;

a mechanical pump;

manually applied pressure; and

an electromechanical system.

18. The guide of Claim 12, further comprising a barrier for to directing said optical coupling fluid toward said sampling site.

19. The guide of Claim 18, wherein said barrier comprises any of:

contact of said guide to said sampling skin to act as a physical barrier;

a device on said guide that minimally deforms said sampling skin to form a physical barrier around said sampling site; and

an adhesive on said guide, circumscribing said sampling site, that couples said guide to said sampling skin around said sampling site.

20. The guide of Claim 1, wherein said mount comprises three reservoirs for containment of an optical coupling fluid, said three reservoirs being placed around said sampling site at approximately the points of an isosceles triangle, each of said reservoirs being connected to a channel via which said optical coupling fluid is lead to said sampling site, said optical coupling fluid spreading between the outer surface of said hydration inducing plug and the skin surface of said sampling site.

21. A method for collecting data used in determining glucose using an optically based noninvasive glucose analyzer, the method comprising the steps of:

coupling an optical probe of said noninvasive glucose analyzer with a placement guide which is coupled to a sampling skin;

delivering incident photons into a sampling site in said sampling skin; and

collecting photons emerging from said sampling site;

wherein said optical probe comprises at least one optical incident member for delivering incident photons into said sampling site and an optical collection member for collecting photons emerging from said sampling site; and

wherein said guide comprises:

a mount having a contact surface at one end, at least a portion of said contact surface being in contact with said sampling skin;

an aperture, defined by said mount, which is adapted to receive said optical probe, wherein an area defined by said aperture comprises said sampling site; and

a hydration inducing plug securely attached, from said aperture, to said mount at said one end, wherein an outer surface of said hydration inducing plug is aligned with said contact surface of said mount, said outer surface being in direct contact with said sampling site;

wherein said hydration inducing plug acts an optical interface between said optical probe and said sampling site when said optical probe is coupled into said aperture.

22. The method of Claim 21, wherein said hydration inducing plug has any of the following characteristics:

hydrophobic;

insulating;

mechanically flexible and strong;

near-IR transmissive from 1100 to 1900 nm; and

index of refraction matched.

23. The method of Claim 21, wherein said hydration inducing plug is made of fluoropolymer.

24. The method of Claim 21, wherein said hydration inducing plug comprises an evenly flat member.

25. The method of Claim 21, wherein said hydration inducing plug comprises multiple layers.

26. The method of Claim 25, wherein each of said layers has its own physical properties.

27. The method of Claim 25, wherein said multiple layers are unevenly heat compressed.

28. The method of Claim 27, wherein the central area of said hydration inducing plug is heat compressed to be thinner than the surrounding area.

29. The method of Claim 21, wherein said hydration inducing plug has an aperture formed in a center thereof, wherein upon said optical probe being coupled with said guide, said optical collection member of said optical probe is coupled into said aperture and has direct contact with said sampling site, while said optical incident member of said optical probe maintains direct contact with the surrounding area of said hydration inducing plug.

30. The method of Claim 21, wherein the inner surface of said hydration inducing plug is shaped as an optical convexity and there is an aperture formed in the center of said hydration inducing plug, such that upon said optical probe being coupled with said guide, said optical collection member of said optical probe is coupled into said aperture and has direct contact with said sampling site.

31. The method of Claim 21, wherein said optical collection member of said optical probe is coupled into said aperture and has direct contact with said sampling site, while a small space is maintained between said hydration inducing plug and said optical incident member of said optical probe.

32. The method of Claim 21, wherein said mount comprises at least one reservoir for containment of an optical coupling fluid, of said reservoir being connected to one or more channels via which said optical coupling fluid is lead to said sampling site, said optical coupling fluid spreading between the outer surface of said hydration inducing plug and the skin surface of said sampling site.

33. The method of Claim 32, wherein said optical coupling fluid is near-IR inactive.

34. The method of Claim 32, wherein said optical coupling fluid comprises any of:

a chlorofluorocarbon; and

a chlorofluorocarbon polymer.

35. The method of Claim 32, wherein said optical coupling fluid comprises any of:

a fluorocarbon molecule;

a fluorocarbon polymer;

a fluorocompound; and

a mixture or solution of any of the above.

36. The method of Claim 32, wherein said optical coupling fluid is delivered in any of a manual and an automated fashion to said sampling site.

37. The method of Claim 32, wherein said optical coupling fluid is directed to said sampling site by at least one of:

gravity;

diffusion;

a guiding channel;

a mechanical pump;

manually applied pressure; and

an electromechanical system.

38. The method of Claim 32, wherein said guide comprises a barrier for directing said optical coupling fluid toward said sampling site.

39. The method of Claim 38, wherein said barrier comprises any of:

contact of said guide to said sampling skin to act as a physical barrier;

a device on said guide that minimally deforms said sampling skin to form a physical barrier around said sampling site; and

an adhesive on said guide, circumscribing said sampling site, that couples said guide to said sampling skin around said sampling site.

40. The method of Claim 21, wherein said mount comprises three reservoirs for containment of an optical coupling fluid, said three reservoirs being placed around said sampling site at approximately the points of an isosceles triangle, each of said reservoirs being connected to a channel via which said optical coupling fluid is lead to said sampling site, said optical coupling fluid spreading between the outer surface of said hydration inducing plug and the skin surface of said sampling site.